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APPLICATION NO.	FILING DATE	FIRST NAMED INVENTOR	ATTORNEY DOCKET NO.	CONFIRMATION NO.
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09/773,844

02/01/2001

Linda M. Braun

BRAUN1-18-15

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10/01/2004

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EXAMINER

WANG, GEORGE Y

ART UNIT

PAPER NUMBER

2871

DATE MAILED: 10/01/2004

Please find below and/or attached an Office communication concerning this application or proceeding.

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Office Action Summary

Application No.

09/773,844

Applicant(s)

BRAUN ET AL.

Examiner

George Y. Wang

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-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --

Period for Reply

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE 3 MONTH(S) FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If the period for reply specified above is less than thirty (30) days, a reply within the statutory minimum of thirty (30) days will be considered timely.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133). Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

Status

- 1) ☒ Responsive to communication(s) filed on 01 June 2004.
- 2a) ☒ This action is **FINAL**. 2b) ☐ This action is non-final.
- 3) ☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

Disposition of Claims

- 4) ☒ Claim(s) 1-3,6 and 8-11 is/are pending in the application.
- 4a) Of the above claim(s) _____ is/are withdrawn from consideration.
- 5) ☐ Claim(s) _____ is/are allowed.
- 6) ☒ Claim(s) 1-3,6 and 8-11 is/are rejected.
- 7) ☐ Claim(s) _____ is/are objected to.
- 8) ☐ Claim(s) _____ are subject to restriction and/or election requirement.

Application Papers

- 9) ☐ The specification is objected to by the Examiner.
- 10) ☒ The drawing(s) filed on 24 May 2001 is/are: a) ☒ accepted or b) ☐ objected to by the Examiner.
Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).
Replacement drawing sheet(s) including the correction is required if the drawing(s) is objected to. See 37 CFR 1.121(d).
- 11) ☐ The oath or declaration is objected to by the Examiner. Note the attached Office Action or form PTO-152.

Priority under 35 U.S.C. § 119

- 12) ☐ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).
- a) ☐ All b) ☐ Some * c) ☐ None of:
1. ☐ Certified copies of the priority documents have been received.
 2. ☐ Certified copies of the priority documents have been received in Application No. _____.
 3. ☐ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).
- * See the attached detailed Office action for a list of the certified copies not received.

Attachment(s)

- 1) ☐ Notice of References Cited (PTO-892)
- 2) ☐ Notice of Draftsperson's Patent Drawing Review (PTO-948)
- 3) ☐ Information Disclosure Statement(s) (PTO-1449 or PTO/SB/08)
Paper No(s)/Mail Date _____.
- 4) ☐ Interview Summary (PTO-413)
Paper No(s)/Mail Date. _____.
- 5) ☐ Notice of Informal Patent Application (PTO-152)
- 6) ☐ Other: _____.

DETAILED ACTION

Claim Rejections - 35 USC § 103

1. The following is a quotation of 35 U.S.C. 103(a) which forms the basis for all obviousness rejections set forth in this Office action:

(a) A patent may not be obtained though the invention is not identically disclosed or described as set forth in section 102 of this title, if the differences between the subject matter sought to be patented and the prior art are such that the subject matter as a whole would have been obvious at the time the invention was made to a person having ordinary skill in the art to which said subject matter pertains. Patentability shall not be negated by the manner in which the invention was made.

This application currently names joint inventors. In considering patentability of the claims under 35 U.S.C. 103(a), the examiner presumes that the subject matter of the various claims was commonly owned at the time any inventions covered therein were made absent any evidence to the contrary. Applicant is advised of the obligation under 37 CFR 1.56 to point out the inventor and invention dates of each claim that was not commonly owned at the time a later invention was made in order for the examiner to consider the applicability of 35 U.S.C. 103(c) and potential 35 U.S.C. 102(e), (f) or (g) prior art under 35 U.S.C. 103(a).

1. Claims 1-3, 6, and 8-11 are rejected under 35 U.S.C. 103(a) as being unpatentable over Thaniyavarn (U.S. Patent No. 5,729,642) in view of Soref (U.S. Patent No 4,671,605, from hereinafter "Soref") and Meli (U.S. Patent No. 5,793,508).

2. As to claim 1, Thaniyavarn discloses a waveguide array (fig. 3, ref. 46) having a plurality of fibers (fig. 3, ref. 48a, 48b, 48c) disposed in a closely spaced array, the array

comprising a first parallel region, a curved region, and a second parallel region where each fiber having a first end disposed in a first linear array and second end disposed in a second linear array, the second linear array comprising fixed reflectors (fig. 1, ref. 15), and the curved regions of the fibers differing in radii of curvature to provide a successive series of monotonically different path lengths that differ by a few millimeters or less. Thaniyavarn further teaches an optical switch (fig. 1, ref. 9) for switching at least one input signal among the fibers.

However, the reference fails to specifically disclose the array for use in a variable optical delay line and a plurality of separately switchable reflectors disposed in each fiber.

Meli discloses an optical telecommunications system having wavelength division multiplexers and delay lines that use a Bragg reflective element that is switchable between reflection and transmission (col. 5, lines 23-30; fig. 1, ref. 13). Soref disclose the application of the array in a variable optical delay line (fig. 1).

It would have been obvious to one of ordinary skill in the art at the time the invention was made to use the array in a variable optical delay line since one would be motivated by use adapt the device for variable optical delay application (Thaniyavarn, col. 5, lines 12-25). Furthermore, because it is well known that an optical time delay is a direct function of optical length (Soref, col. 2, lines 51-63), it would have been obvious to one of ordinary skill in the art the time the invention was made to use a plurality of switchable reflectors since one would be motivated to reflect radiation in a narrow wavelength band and transmit the radiation outside of this band (Meli, col. 5, lines 23-

30). In addition, because the refractive index has a periodic variation, the signal portions are reflected at each index change in a timed relationship, which is ideal for optical delay systems (col. 5, lines 23-30).

3. As per claims 2 and 9, Thaniyavarn and Soref disclose the variable delay line as recited above wither the optical switch comprises a MEM mirror optical switch (fig. 1, ref. 14) optically coupled to the plurality of fibers for switching at least one optical input signal among the fibers.

4. Regarding claims 3 and 6, Thaniyavarn and Soref disclose the variable delay line as recited above. However, Thaniyavarn fails to specifically teach a reflective Bragg grating.

Meli discloses an optical telecommunications system having wavelength division multiplexers and delay lines that use a reflective Bragg grating (col. 5, lines 23-30; fig. 1, ref. 13).

It would have been obvious to one of ordinary skill in the art the time the invention was made to use a reflective Bragg grating since one would be motivated by its ability to reflect radiation in a narrow wavelength band and transmit the radiation outside of this band (col. 5, lines 23-30). Furthermore, because the refractive index has a periodic variation, the Bragg grating reflects signal portions at each index change in a timed relationship, which is ideal for optical delay systems (col. 5, lines 23-30).

5. As to claim 8, Thaniyavarn and Soref disclose the variable optical delay line as recited above where the plurality of optical fibers are secured on a substrate support that is a sheet (fig. 3, ref. 46).

6. Regarding claims 10-11, Thaniyavarn et al. discloses the variable optical delay line as recited above where one optical input signal and the optical switch comprises an NxN MEM switch (Thaniyavarn, fig. 1), where the inputs signals are of varying wavelengths (Meli, abstract).

Response to Arguments

7. Applicant's arguments with respect to claims 1-3, 6, and 8-11 have been considered but are moot in view of the new ground(s) of rejection.

Applicant's first argument is that the prior art of record fails to teach separately switchable reflectors. While Applicant admits that Meli discloses Bragg gratings can be used as filters, Applicant argues that these gratings are not switchable. Examiner disagrees. First, it has been held that the recitation that an element is capable to perform a function is not a positive limitation but only requires the ability to so perform. It does not constitute a limitation in any patentable sense. *In re Hutchinson*, 69 USPQ 138. Second, even if it is a patentable limitation, a Bragg grating certainly can be read as being "switchable" since one may manually change the type of grating used for another that has different reflective/transmissive characteristics to provide coarse delay

increments. After all, Applicant's claimed invention does not disclose components for a detailed mechanism on how the reflectors accomplish "switchability."

Applicant's second argument is that the prior art of record fails to teach path lengths differing by a few millimeters or less. Examiner disagrees. The Thaniyavarn reference clearly discloses the curved regions of the fibers differing in radii of curvature to provide successive series of monotonically different path lengths (col. 4, lines 64-66). It is noted the limitation, a "few millimeters or less" is a broad limitation that can be met by anything substantially within or less than the "few" standard. Therefore, from the lengths waveguide spacings (col. 4, line 66 – col. 5, line 3) being only less than 50 microns apart, it can easily be inferred that the path lengths differ by a few millimeters or less.

Therefore, Examiner holds to the validity of the references and maintains rejection.

Conclusion

8. **THIS ACTION IS MADE FINAL.** Applicant is reminded of the extension of time policy as set forth in 37 CFR 1.136(a).

A shortened statutory period for reply to this final action is set to expire THREE MONTHS from the mailing date of this action. In the event a first reply is filed within TWO MONTHS of the mailing date of this final action and the advisory action is not mailed until after the end of the THREE-MONTH shortened statutory period, then the shortened statutory period will expire on the date the advisory action is mailed, and any

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extension fee pursuant to 37 CFR 1.136(a) will be calculated from the mailing date of the advisory action. In no event, however, will the statutory period for reply expire later than SIX MONTHS from the mailing date of this final action.

Any inquiry concerning this communication or earlier communications from the examiner should be directed to George Y. Wang whose telephone number is 571-272-2304. The examiner can normally be reached on M-F, 8 am - 4:30 pm.

If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, Robert H. Kim can be reached on 571-272-2293. The fax phone number for the organization where this application or proceeding is assigned is 703-872-9306.

Information regarding the status of an application may be obtained from the Patent Application Information Retrieval (PAIR) system. Status information for published applications may be obtained from either Private PAIR or Public PAIR. Status information for unpublished applications is available through Private PAIR only. For more information about the PAIR system, see <http://pair-direct.uspto.gov>. Should you have questions on access to the Private PAIR system, contact the Electronic Business Center (EBC) at 866-217-9197 (toll-free).

gw
September 29, 2004


TARIFUR R. CHOWDHURY
PRIMARY EXAMINER